Claim 32 (previously presented): A method for making an implement with improved accuracy for measurement or control of a physical quantity by canceling out error due to an interfering noise N so as to provide an error corrected output V_C, sensitive to a signal input I, which includes the steps:

find or construct a sensor with an output V which has a signal to noise ratio SNR which changes substantially when the condition of an operating parameter Q is selectively modulated,

provide means whereby said output V of the said sensor in a higher said SNR state due to a condition of said operating parameter Q is combined with said output V of said sensor in a lower said SNR state due to a different said condition of said operating parameter Q, and

adjust said combined so that the said noise N mostly cancels but said sensor continues to have a good gain for said signal input I.

Claim 33 (previously presented): A method as claimed in claim 32, wherein said input I and said noise N are conditioned, or generally change by only a small amount during the time duration of one full operating cycle of change of said condition of said operating parameter Q.

Claim 34 (previously presented): A method as claimed in claim 32, wherein said sensor comprises at least two said sensors or a composite sensor having at least two sectors, and wherein each one of said two sensors or said two sectors operates full time at a different said condition of said operating parameter Q,

so that there is thereby no need to have a short operating cycle time and no need to condition said input I and said noise N or require that they be generally constant over said one full operating cycle.

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Claim 35 (previously presented): A method as claimed in Claim 32 wherein said sensor is a non-contact ammeter which incorporates at least one Hall device associated with a magnetic core SQ.

Claim 36 (previously presented): A method as claimed in Claim 32 wherein said sensor is a non-contact ammeter which incorporates at least one Hall device associated with a magnetic core SQ, and

wherein said operating parameter Q is the magnetic reluctance of said magnetic core SQ.

Claim 37 (previously presented): A method as claimed in claim 32 wherein said sensor is a non-contact ammeter which incorporates a Swain type coupling winding N_S wound on a core SQ.

Claim 38 (previously presented): A method as claimed in claim 32 wherein said sensor is a non-contact ammeter which incorporates a Swain type sense coupling winding N_S on a core SQ, and wherein said operating parameter Q is the peak current I_{sm} in said sense coupling winding N_S.

Claims 39 - 47 (canceled)

Claim 48 (previously presented): A process for constructing an improved machine having a machine output V_c for at least one of measuring or controlling a physical quantity I by canceling out an error in said machine output V_c due to an interfering noise N so as to provide an error corrected machine output V_c which is sensitive to said physical quantity I, which includes at least the steps: find/construct, and provide; described as follows:

at least one of find or construct a sensor with an output V which has a signal to noise ratio SNR which changes substantially when the condition of an Operating Parameter is selectively modulated; and

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provide means whereby said sensor output V in a higher said SNR state due to a condition of said Operating Parameter Q is

combined with said sensor output V in a lower said SNR state due to an different said condition of said Operating Parameter Q; and

adjust at least one of said combined, said Operating Parameter Q or said sensor so that the said error due to said noise N mostly cancels at the said machine output V_c, but

said machine output V_c is well responsive to said physical quantity I.

Claim 49 (previously presented): A process as claimed in claim 48, wherein said physical quantity I and said noise N during the time duration of one full operating cycle of change of said condition of said operating parameter Q are at least one of: changed by only a small amount naturally, or are so conditioned.

Claim 50 (previously presented): A process as claimed in claim 48, wherein said sensor comprises at least one of: at least two said sensors or a composite sensor having at least two sectors, and wherein each one of said two sensors or said two sectors operates full time at a different said condition of said operating parameter Q,

so that there is thereby no need to have a short operating cycle time and no need to condition said physical quantity I and said noise N or require that they be generally constant over said one full operating cycle.

Claim 51 (previously presented): A process as claimed in Claim 48 wherein said sensor is a non-contact ammeter which incorporates at least one Hall device associated with a magnetic core SQ.

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Claim 52 (previously presented): A process as claimed in Claim 48 wherein said sensor is a non-contact ammeter which incorporates at least one Hall device associated with a magnetic core SQ, and

wherein said operating parameter Q is the magnetic reluctance of said magnetic core SQ.

Claim 53 (previously presented): A process as claimed in claim 48 wherein said sensor is a non-contact ammeter which incorporates a Swain type sense coupling winding N_S wound on a core SQ.

Claim 54 (previously presented): A process as claimed in claim 48 wherein said sensor is a non-contact ammeter which incorporates a Swain type sense coupling winding N_S on a core SQ, and wherein said operating parameter Q is at least one of the peak current I_{sm} or the number of turns in said sense coupling winding N_S.

Claims 55 - 63 (canceled)

Claim 64 (currently amended): ~~I claim~~ a method for making a more accurate implement for at least one of measurement or control including the steps:

Construct a port for desired input signal I, which of necessity makes a port for undesired error producing interference N,

construct a port for said implement's output V_C,

acquire an Essential Characteristic type sensor having an output V responsive to said desired input signal I, and also

responsive to said undesired error producing interference N, and further

having an operating parameter of magnitude Q;

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show that said Essential Characteristic type sensor has a useful said Essential Characteristic evidenced by

a signal to noise ratio SNR of said sensor observed to change a lot when the

said magnitude Q of said operating parameter is modulated over a practical range;

provide said implement equipped to:

support said sensor and ~~at least one of:~~

largely cancel said interference N but retain a good signal I at said output V_C by

suitably modulating said magnitude Q,

operating on said sensor output V and

coupling the result to said output V_C of said implement in a manner such that

a reduced form of the said sensor output V in a lower said SNR state is

combined with said sensor output V in a higher said SNR state so that

said interference N largely cancels~~;~~.

~~or;~~

~~considerably reduce said undesired interference N relative to said desired signal I at said output V_C by~~

~~holding said magnitude Q in a higher said SNR state and~~

~~coupling said sensor output V to said implement output V_C~~.

Claim 65 (canceled)

Claim 66 (currently amended): ~~I claim~~ a method for making a more accurate sensor with implement for at least one of measurement or control, made in steps:

obtain a said sensor having an output V responsive to a physical quantity input I, the gain g given by

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$$g \equiv \frac{\delta V}{\delta I}, \text{ and}$$

said output V is also responsive to an undesired error producing interference N, the sensitivity Ψ being

$$\Psi \equiv \frac{\delta V}{\delta N}, \text{ and}$$

in addition, said sensor has an operating parameter of magnitude Q which modulates said Ψ, and to a lesser extent said gain g;

at least one of calibrate, or make by a proven process, or otherwise assure that said sensor has a strong Essential Characteristic evidenced by observing that said Sensitivity Ψ changes a lot more than said gain g when said magnitude Q is driven over a practical range of values;

~~and at least one of:~~

~~provide an error reducing form of said implement, fitted to support said sensor, and~~

~~also fitted to drive said magnitude Q and hold it at a constant value, and by at least one of measurement or a proven process, set said magnitude Q at a value corresponding to a said sensitivity Ψ which is a lot less than heretofore while said gain g is still good,~~
~~thus making said sensor with implement substantially more accurate than comparable transducers for said input I in the presence of said interference N.~~
~~or;~~

provide an error correction form of said implement having an output V_c, and
also fitted to support said sensor, and

further equipped with state means

driving said magnitude Q,

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dividing the said output V, and

combining the said output V, and

wherein said combining is coupled to said implement output V_c;

construct the said state means so that there is at least one state "A" wherein

said means drive said magnitude Q to produce a large said sensitivity Ψ with good said gain g, and also said sensor output V is largely said divided and made available for said combining;

further construct said state means so that there is also at least one state "ß" wherein

said means drive said magnitude Q to produce a small said sensitivity Ψ with good said gain g, and

also said sensor output V is but slightly said divided and made available for said combining;

to get said error correction, at least one of:

set by a proven process, or adjust at least one of a said means dividing or said means combining so that

the said largely divided said large Ψ of said state "A" is about equal to and opposite from the said but slightly divided said small Ψ of said state "ß", and

thereby the said Ψ's approximately cancel in said combiner so that

the said error producing interference N is mostly removed from said output V_c; and

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not withstanding there is remaining at said V_c a large part of said responsiveness to said physical quantity input I;

so that thereby said sensor with implement is a whole lot more accurate than comparable transducers for said physical quantity input I in the presence of said interference N.

Respectfully submitted,

William H. Swain

William H. Swain
Inventor

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